

ABSTRACT

A silica layer is provided which is usable as a low refractive index undergoing no change in its refractive index. Further, a silica layer is provided which is highly productive and usable as
5 a medium or high refractive index layer undergoing neither reduction in transmittance nor change in spectral colors. Still further, an antireflection film using these silica layers is provided. These silica layers are: a silica layer composed of an organic silicon compound, which has a refractive index of not less than 1.40 and
10 not more than 1.46 ($\lambda = 550 \text{ nm}$), and whose composition is represented by $\text{SiO}_x\text{C}_y : \text{H}$ ($x = 1.6 \text{ to } 1.9$, $y = 0.2 \text{ to } 1.0$); a carbon-containing silica layer, which has a refractive index of not less than 1.55 and less than 1.80 ($\lambda = 550 \text{ nm}$), and whose composition is represented by SiO_aC_b ($a = 0.7 \text{ to } 1.7$, $b = 0.2 \text{ to } 1.4$); and a silica layer containing
15 carbon, which has a refractive index of not less than 1.80 and not more than 2.50 ($\lambda = 550 \text{ nm}$), and whose composition is represented by SiO_dC_e ($d = 0.5 \text{ to } 0.9$, $e = 1.0 \text{ to } 2.0$). These silica layers are used to form the antireflection film.